ORIGINATION FORM

Date: **5-28-14**
Originator: Larry Jones
Contact Information: **850-414-4305**

Specification Title: **455 Structures Foundations**
Specification Section, Article, or Subarticle Number: **455-15**

Why does the existing language need to be changed? **FDOT sponsored research indicates concreting issues for drilled shafts when bentonite slurry viscosity exceeds 40.**

Summary of the changes: **Maximum range of mineral slurry viscosity reduced from 50 to 40.**

Are these changes applicable to all Department jobs? **Yes**
If not, what are the restrictions?

Will these changes result in an increase or decrease in project costs? **No.**
If yes, what is the estimated change in costs?

With who have you discussed these changes? **David Horhota & Juan Castellanos**

What other offices will be impacted by these changes? **Construction**

Are changes needed to the PPM, Design Standards, SDG, CPAM or other manual? **No**

Are all references to external publications current? N/A
If not, what references need to be updated (please include changes in the redline)?

Is a Design Bulletin, Construction Memo, or Estimates Bulletin needed? **No.**

Contact the State Specifications Office for assistance in completing this form.
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ANANTH PRASAD, P.E.
SECRETARY

M E M O R A N D U M

DATE: June 5, 2014

TO: Specification Review Distribution List

FROM: Daniel Scheer, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: 4551508 Structures Foundations – Mineral Slurry**.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

The changes are proposed by Larry Jones of the State Structures Design Office to mineral slurry viscosity from 50 to 40. FDOT sponsored research indicates concreting issues for drilled shafts when bentonite slurry viscosity exceeds 40.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DS, or daniel.scheer@dot.state.fl.us. Comments received after **July 4, 2014,** may not be considered. Your input is encouraged.

DS/ft
Attachment

STRUCTURES FOUNDATIONS – MINERAL SLURRY.

(REV ~~12-17-13~~*5-28-14* ~~(FA 1-22-14) (7-14)~~)

SUBARTICLE 455-15.8.1 is deleted and the following substituted:

455-15.8.1 Mineral Slurry: When mineral slurry is used in an excavation, use only processed attapulgite or bentonite clays with up to 2% (by dry weight) of added polymer. Use mineral slurry having a mineral grain size such that it will remain in suspension and having sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. Use a percentage and specific gravity of the material to make the suspension sufficient to maintain the stability of the excavation and to allow proper placement of concrete. Ensure that the material used to make the slurry is not detrimental to concrete or surrounding ground strata. During construction, maintain the level of the slurry at a height sufficient to prevent caving of the hole. In the event of a sudden significant loss of slurry such that the slurry level cannot practically be maintained by adding slurry to the hole, backfill the excavation and delay the construction of that foundation until an alternate construction procedure has been approved.

Thoroughly premix the slurry with clean fresh water prior to introduction into the shaft excavation. Ensure that the percentage of mineral admixture used to make the suspension is such as to maintain the stability of the shaft excavation. The Engineer will require adequate water and/or slurry tanks when necessary to perform the work in accordance with these Specifications. The Engineer will not allow excavated pits on projects requiring slurry tanks without the written permission of the Engineer. Take the steps necessary to prevent the slurry from “setting up” in the shaft, including but not limited to agitation, circulation, and/or adjusting the composition and properties of the slurry. Provide suitable offsite disposal areas and dispose of all waste slurry in a manner meeting all requirements pertaining to pollution.

Provide a CTQP qualified drilled shaft inspector to perform control tests using suitable apparatus on the mineral slurry mixture to determine the following parameters:

(a) Freshly mixed mineral slurry: Measure the density of the freshly mixed mineral slurry regularly as a check on the quality of the suspension being formed using a measuring device calibrated to read within plus or minus0.5 pound per cubic foot.

(b) Mineral slurry supplied to the drilled shaft excavation: Perform the following tests on the mineral slurry supplied to the shaft excavation and ensure that the results are within the ranges stated in the table below:

Item to be measured	Range of Results at 68ºF	Test Method
Density	64 to 73 lb/ft^3 (in fresh water environment) 66 to 75 lb/ft^3 (in salt water environment)	Mud density balance: FM 8-RP13B-1
Viscosity	30 to ~~50~~ *~~40~~* seconds	Marsh Cone Method: FM 8-RP13B-2
pH	8 to 11	Electric pH meter or pH indicator paper strips: FM 8-RP13B-4
Sand Content	4% or less	FM 8-RP13B-3

The Contractor may adjust the limits in the above table when field conditions warrant as successfully demonstrated in a test hole or with other methods approved by the Engineer. The Engineer must approve all changes in writing before the Contractor can continue to use them.

Perform tests to determine density, viscosity, and pH value to establish a consistent working pattern, taking into account the mixing process and blending of freshly mixed mineral slurry and previously used mineral slurry. Perform a minimum of four sets of tests to determine density, viscosity, and pH value during the first 8 hours mineral slurry is in use.

When the results show consistent behavior, discontinue the tests for pH value, and only carry out tests to determine density and viscosity during each four hours mineral slurry is in use. If the consistent working pattern changes, reintroduce the additional tests for pH value for the time required to establish consistency of the test values within the required parameters.

(c) The Department may perform comparison tests as determined necessary during the mineral slurry operations.

During construction, maintain the level of mineral slurry in the shaft excavation within the excavation and at a level not less than 4 feet above the highest expected piezometric water pressure along the depth of a shaft.

At any time the wet construction method of stabilizing excavations fails, in the opinion of the Engineer, to produce the desired final result, discontinue this method of construction, and propose modifications in procedure or alternate means of construction for approval.